

Abstract

A device is provided, having a first electrode, a second electrode, and a photoactive region disposed between the first electrode and the second electrode. The photoactive region includes a first organic layer comprising a mixture of an organic acceptor material and an organic donor material, wherein the first organic layer has a thickness not greater than 0.8 characteristic transport lengths, and a second organic layer in direct contact with the first organic layer, wherein: the second organic layer comprises an unmixed layer of the organic acceptor material or the organic donor material of the first organic layer, and the second organic layer has a thickness not less than about 0.1 optical absorption lengths. Preferably, the first organic layer has a thickness not greater than 0.3 characteristic transport lengths. Preferably, the second organic layer has a thickness of not less than about 0.2 optical absorption lengths. Embodiments of the invention can be capable of power efficiencies of 2% or greater, and preferably 5% or greater.